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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,988	03/30/2004	Bingjie Miao	BEA9-2003-0030-US1	3147

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EXAMINER

PANNALA, SATHYANARAYAN R

ART UNIT	PAPER NUMBER
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2164

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/811,988	Applicant(s) MIAO ET AL.	
	Examiner Sathyanarayan Pannala	Art Unit 2164	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 16-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 16-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's Amendment filed on 12/21/2006 has been entered with amended claims 1, 7, 14 and 19 and cancelled claim 15. In this Office Action, claims 1-14 and 16-19 are pending.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1 and 7 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. As per claim 1, 7 and 19, there should be specific implementation of the current invention involved and the specification does not support. Whereas Applicant is claiming as "Applying said estimated result size to memory allocation for said Group-By operation." The specification does not support any application to apply. Regarding claim 7, neither the specification nor the drawings support the claiming on page 3, line 2 as "a processor in communication with storage media."

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1, 7 and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. As per claim 1, 7 and 19, there should be specific implementation of the current invention involved and the specification does not support. Whereas Applicant is claiming as "Applying said estimated result size to memory allocation for said Group-By operation." The specification does not support any application to apply. Regarding claim 7, neither the specification nor the drawings support the claiming on page 3, line 2 as "a processor in communication with storage media."

Claim Rejections - 35 USC § 101

6. 35 U.S.C. § 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 1-19 are rejected under 35 U.S.C. § 101, because none of the claims are directed to statutory subject matter. Independent claims 1, 7 and 14 deals with simple mathematical abstract idea. A claim that recites a computer that solely calculates a mathematical formula or a computer disk that solely stores a mathematical formula is not directed to the type of statutory subject matter eligible for patent protection. The

claims are not producing useful, concrete and tangible results. See Diehr, 450 U.S. at 186 and Gottschalk v. Benson, 409 U.S. 63, 71-72 (1972).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1-4, 7-11, 14, 16-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agrawal et al. (US Patent 5,832,475) hereinafter Agrawal, in view of Choudhuri et al. (US Patent 6,842,753) hereinafter Choudhuri, and in view of Soderstrom et al. (US Patent 6,741,982) hereinafter Soderstrom.

10. As per independent claims 1, 7 and 14, Agrawal teaches a method for execution of GROUP-BY operations by a database system on a relation given by the terms. The method includes an operator is generated by the system based on the data stored in the relation (col. 2, lines 45-51). Agrawal teaches the claimed, calculating a cumulative selectivity based upon aggregation of individual selectivity of each column in a group of tables in a Group-By operation (col. 15, line 33 to col. 16, line 19). Agrawal teaches the claimed, applying said estimated result size to memory allocation for said Group-By operation (col. 16, lines 22-25). Agrawal does not teach using multiplying calculated cumulative selectivity. However, Choudhuri teaches the claimed, multiplying calculated cumulative selectivity by an input size of said operation (col. 16, lines 39-56). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention, to combine the teachings of the cited references because Choudhuri's teachings would have allowed Agrawal's method to estimate an accurate way the results aggregation of queries having selection conditions and Group-By's (col. 3, lines 21-23).

Agrawal and Chaudhuri do not teach database having multiple tables. However, Soderstrom teaches the claimed, organizing a database stored on a computer readable medium with data records maintained in multiple tables (Fig. 2, col. 13, lines 49-53). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention, to combine the teachings of the cited references because Soderstrom's teachings would have allowed Agrawal's method to provide fast and efficient access to data stored in a database system supporting one query language,

when data is requested by a system application supporting another query language (col. 3, lines 21-23).

Agrawal teaches the remaining limitation of claim 7, a processor in communication with storage media (col.4, lines 22-23).

11. As per dependent claims 2 and 8, Agrawal and Choudhuri combined teaches claim 1. Choudhuri teaches the claimed, the step of calculating a cumulative selectivity includes normalizing a selectivity for each column in said group (Fig. 6, col. 14, lines 1-5). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention, to have combined the teachings of the cited references because Choudhuri's teachings would have allowed Agrawal's method to estimate an accurate way the results aggregation of queries having selection conditions and Group-By's (col. 3, lines 21-23).

12. As per dependent claims 3, 9-10 and 16-17, Agrawal and Choudhuri combined teach claims 1, 7 and 14. Choudhuri teaches the claimed, the step of normalizing a selectivity for each column includes applying a weight factor to said selectivity based upon a relative size of a table in which said column resides (Fig. 6, col. 14, lines 14-40). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention, to combine the teachings of the cited references because Choudhuri's teachings would have allowed Agrawal's method to estimate an accurate

way the results aggregation of queries having selection conditions and Group-By's (col. 3, lines 21-23).

13. As per dependent claims 4, 11, Agrawal and Choudhuri combined teach claims 1 and 14. Choudhuri teaches the claimed, the step of calculating a cumulative selectivity is based upon the following mathematical relationship:

$S_{sub.ab} = S_{sub.a} + S_{sub.b} - (S_{sub.a} \times S_{sub.b})$, wherein $S_{sub.a}$ is a selectivity of column "a", $S_{sub.b}$ is the selectivity of column "b", and $S_{sub.ab}$ is a cumulative selectivity of columns "a" and column "b" (Col. 15, lines 1-14). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention, to have combined the teachings of the cited references because Choudhuri's teachings would have allowed Agrawal's method to estimate an accurate way the results aggregation of queries having selection conditions and Group-By's (col. 3, lines 21-23).

14. As per independent claim 19, Agrawal teaches a method for execution of GROUP-BY operations by a database system on a relation given by the terms. The method includes an operator is generated by the system based on the data stored in the relation (col. 2, lines 45-51). Agrawal teaches the claimed, applying said estimated result size to memory allocation for said Group-By operation (col. 16, lines 22-25). Agrawal does not explicitly teach calculating cumulative selectivity. Choudhuri teaches the claimed, calculating a cumulative selectivity based upon aggregation of individual

selectivity of each column in a group of tables in a Group-By operation, wherein the step of calculating a cumulative selectivity is based upon the following mathematical relationship: $S_{sub.ab} = S_{sub.a} + S_{sub.b} - (S_{sub.a} \times S_{sub.b})$, wherein $S_{sub.a}$ is a selectivity of column "a", $S_{sub.b}$ is the selectivity of column "b", and $S_{sub.ab}$ is a cumulative selectivity of columns "a" and column "b" (Col. 15, lines 1-14).

Agrawal does not explicitly teach multiplying calculated cumulative selectivity. However, Choudhuri teaches the claimed, multiplying said calculated cumulative selectivity by an input size of said Group By operation (col. 16, lines 39-56). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention, to combine the teachings of the cited references because Choudhuri's teachings would have allowed Agrawal's method to estimate an accurate way the results aggregation of queries having selection conditions and Group-By's (col. 3, lines 21-23).

15. Claims 5-6, 12-13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agrawal et al. (US Patent 5,832,475) hereinafter Agrawal, in view of Choudhuri et al. (US Patent 6,842,753) hereinafter Choudhuri, in view of Soderstrom et al. (US Patent 6,741,982) hereinafter Soderstrom, and in view of Dageville et al. (USPA Pub. 2003/0065688 A1) hereinafter Dageville.

16. As per dependent claims 5, and 12, Agrawal, Choudhuri and Soderstrom do not explicitly teach an iterative application. Dageville teaches the claimed, an iterative

application of said mathematical relationship for each additional column in said group (Fig. 6, page 8, paragraph [0090]). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention, to have combined the teachings of the cited references because Dageville's teachings would have allowed Agrawal's method to provide a dynamic adaptive scheme which integrates scheduling and memory allocation and is shown to perform effectively under widely varying workloads (page 1, paragraph [0010]).

17. As per dependent claims 6, 13 and 18, Agrawal and Choudhuri do not teach using query predicates. Dageville teaches the claimed, the step of calculating a cumulative selectivity includes equivalent columns of said group based upon query predicates (Fig. 6, page 8, paragraph [0094]). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention, to have combined the teachings of the cited references because Dageville's teachings would have allowed Agrawal's method to provide a dynamic adaptive scheme which integrates scheduling and memory allocation and to perform effectively under widely varying workloads (page 1, paragraph [0010]).

Response to Arguments

18. Applicant's arguments filed on 12/21/2006 have been fully considered but they are not persuasive and details as follows:

- a) Applicant's argument stated as "there is no mention of the individual terms 'cumulative' or 'selectivity' in the entire patent of Agrawal et al."

In response to Applicant argument, Examiner disagrees because the second reference of Chaudhuri is combined with Agrawal's teaching. Agrawal as well Chaudhuri teaches estimation of memory size required for Group-By operation. Current invention did not establish any practical implementation and no proper evidence are provided for patentability. Further, in response to applicant's argument, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

Conclusion

19. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sathyanarayan Pannala whose telephone number is (571) 272-4115. The examiner can normally be reached on 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Rones can be reached on (571) 272-4085. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Sathyanarayan Pannala
Primary Examiner